A NEW JOINT-FORMATION

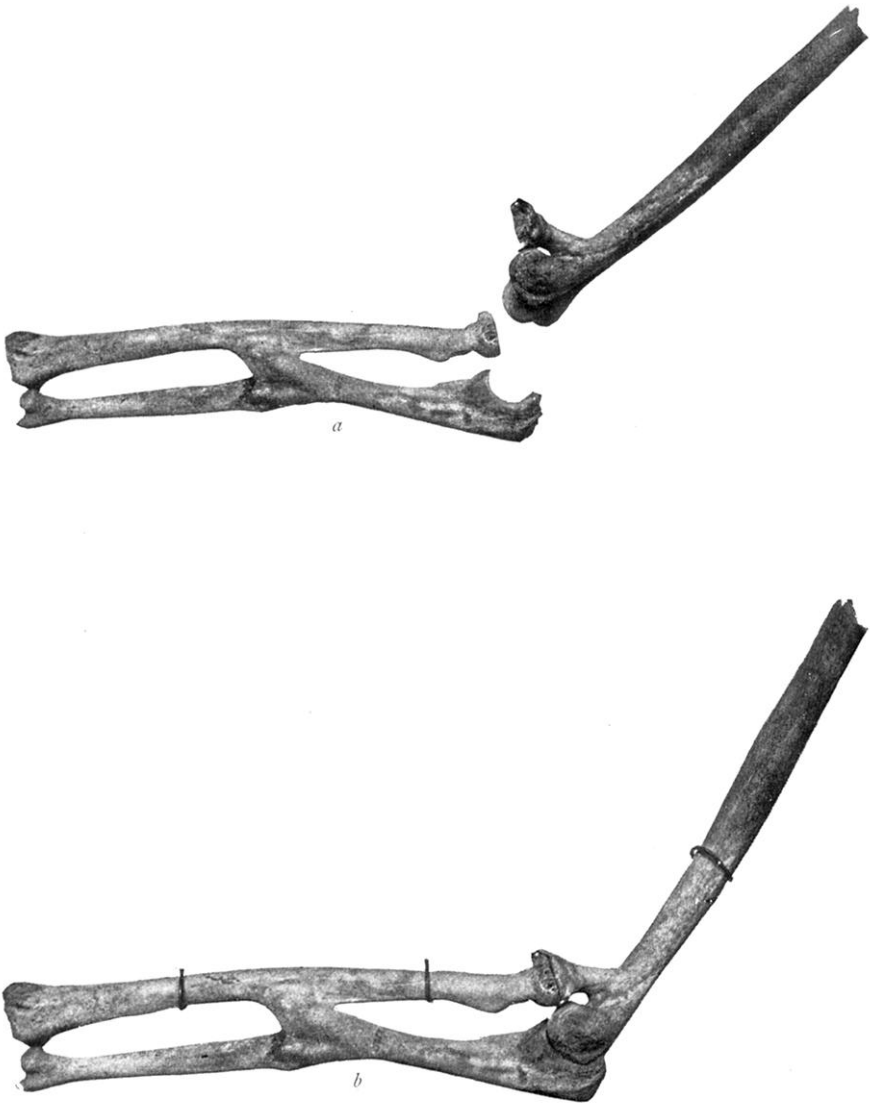
By ALEŠ HRDLIČKA

The specimen herein described shows in a very remarkable and beautiful way the great *vis medicatrix naturæ*. It consists of bones of the left arm and forearm, found by Mr Harlan I. Smith during his exploration of a prehistoric burial-place on the Fox farm at Mayslick, Kentucky. This exploration was conducted under the direction of the department of anthropology of the American Museum of Natural History. To the officers of the museum I am greatly indebted for the privilege of studying this interesting specimen, and for permission to publish the following description and the accompanying photographic illustration.

As will be seen from the plate (XXVII) the interest of the specimen lies mainly in the fact of a new joint-formation between the head of a dislocated radius and a bony process proceeding from the distal end of the humerus.

The genetic history of the new joint, from what we can observe in the bones, is as follows: Originally there were here the three normal, and in all probability already adult, bones of the arm and the forearm. Subsequently the ulna became fractured a little above the middle. This was probably an incomplete fracture, and at the same time there took place a complete forward dislocation of the head of the radius, but without either this bone or the humerus being injured. Neither the fracture nor the dislocation was reduced. The broken ulna became united by a small callus. More callus bone was thrown out around the spine of the proximal segment, which was inclined to and possibly at times touched the interosseous border of the radius, and eventually this part of the proximal segment became united to the radius by an osseous band nearly 3 cm. wide.

The head of the radius remained fully dislocated, and has un-



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a. The bones separated. *b*. The bones in position

dergone apparently no change whatever, unless it is a very slight lengthening. This supports the probability that the bones at the time of the fracture and dislocation were those of a fully developed adult. There is no indication that the humerus was in any way injured; nevertheless, at some time after the injury, there started from the anterior border, and partly also from the external surface of the humerus, immediately above the coronoid fossa, a bony process, which grew forward, downward, and slightly outward until it exactly met the free and, as already stated, unchanged head of the radius, forming with this head not an ankylosis, but a new, free joint. The mean length of this process is 3.1 cm.; its circumference at its middle is 3.5 cm.; the diameters of the joint are antero-posteriorly 2.2 cm., and laterally 2.4 cm. The process ends in an articular socket which is 7 mm. deep in the center, but as parts of the border are broken on one side, it might have been 1 mm. deeper. The surface of the socket presents in the middle an irregular row of large vascular perforations, but outside of these it is for the greater part smooth, and there can be no doubt that it was covered with synovium. The distal two-thirds of the process are entirely free from the humerus.

We have here, in brief, then, the following conditions: The normal and apparently uninjured humerus sends out through all the parts superposed a regular new formation—a veritable process—to meet, support, and form a joint with the head of the dislocated radius almost an inch and a half distant. Such formations are no doubt extremely rare in man. I have no personal knowledge of anything closely similar, and I am unable to find such a case described. Regenerations of bone to which the condition in the specimen is related, are much more frequent in the lower animals than in man.

As to the exciting cause of the new process of bone, it most probably was a moderate injury of either the ligaments or the periosteum of the distal end of the humerus.